

San Francisco Bay Hydrologic Region

Setting

The San Francisco Bay Hydrologic Region, which occupies parts of nine counties, extends from southern San Mateo County north to Tomales Bay in Marin County, and inland to the confluence of the Sacramento and San Joaquin Rivers near Collinsville. The eastern boundary follows the crest of the Coast Range, the highest peaks of which are over 3,000 feet above sea level. Streams in the region flow into the Bay-Estuary or to the Pacific Ocean. The climate within the region varies significantly from west to east. Coastal areas are typically cool and often foggy and inland valleys are warmer, with a Mediterranean-like climate. The region does not have an abundance of natural lakes or constructed reservoirs and relies chiefly on water storage in adjacent and remote counties for its stored supplies.

Portions of the region are highly urbanized and include the San Francisco, Oakland, and San Jose metropolitan areas. Agricultural acreage occurs mostly in the north, with the predominant crop being grapes. In the coastal zone south of the Golden Gate, more than half of the irrigated acres are in high value specialty crops, such as artichokes, strawberries or flowers.

Suisun Marsh in the North Bay is the largest contiguous brackish water marsh remaining on the west coast of North America, providing more than 10% of California's remaining natural wetlands. The region boasts other significant Pacific Coast 9Pescadero marsh and Tomales Bay marshes among them) and East Bay, San Pablo Bay and recovering South Bay marsh areas. Delta outflow controls salt water intrusion from the ocean into the San Francisco Bay Estuary and influences the distribution of many estuarine fishes and invertebrates.

In the early 1900's, local water agencies developed significant imported water supplies from the Mokelumne and Tuolumne Rivers to meet the anticipated demands. At the same period of time, local reservoirs and watersheds were being developed to capture surface supplies and to act as terminal reservoirs for the larger projects. The Mokelumne River Aqueduct delivers Mokelumne River water to 20 cities and 15 unincorporated communities. The Hetch Hetchy Aqueduct delivers Tuolumne River water to the City and County of San Francisco and to 30 water districts, cities, and local agencies. Russian and Eel River (North Coast Region) water is delivered from the Russian River Project to four contractors in the San Francisco Bay

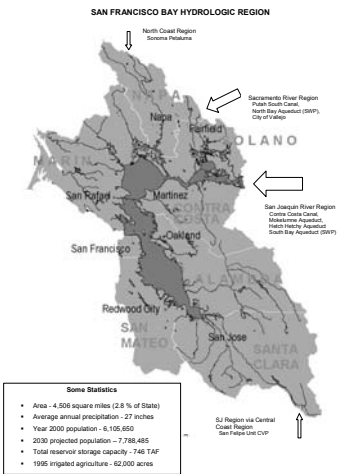


Figure X. Map of the San Francisco Bay Hydrologic Region can be found on page 4-22. When the digital version is completed, the reader will be able to click on this map for a full-page view.

WATER BALANCE SUMMARY - TAF			
Water Entering the Region = Water Leaving the Region + Storage Changes in Region			
(See Volume 2 for Details)	1998 (est)	2000 (average)	2001 (est)
Water Entering the Region			
Precipitation	11,438	6,844	4,008
Imports from Other Regions	300	811	834
Total	12,247	7,655	4,842
Water Leaving the Region			
Consumptive Use of Applied Water*	384	406	430
Losses, Min. Withdrawals	0	0	0
Exports to Other Regions	23	22	22
Required Outflow to Ocean	696	716	755
Evaporation, Evapotranspiration of Native Vegetation, Groundwater Subsurface Outflows, Natural and Incidental Runoff, Ag Effective Precipitation & Other Outflows	11,141	6,477	4,780
Total	12,243	7,623	5,987
Storage Changes in the Region			
Change in Surface Reservoir Storage	78	-25	-25
Change in Groundwater Storage	-72	-143	-210
Total	6	-168	-235
Applied Water* (compare with Consumptive Use)	1,123	1,167	1,231

* Definition - Consumptive use is the amount of applied water used and no longer available as a source of supply. Applied water is greater than consumptive use because it includes consumptive use, reuse, and outflow.

Figure X. Water Balance Summary of the San Francisco Bay Hydrologic Region can be found on page 4-21. When the digital version is completed, the reader will be able to click on this for a full-page view.

Region. The Solano Project is a U. S. Bureau of Reclamation project which provides water from Lake Berryessa, located in the Sacramento River drainage basin. The State Water Project and the federal Central Valley Project bring Sacramento and San Joaquin River supplies into the region.

Groundwater use accounts for only about 5 percent of the region's average water year supply. The more heavily used basins include the Santa Clara Valley, Napa-Sonoma Valley, and Petaluma Valley Groundwater Basins. Recycled water in the Bay Area is used in the full spectrum of applications, including

landscape irrigation, industrial cooling, agricultural needs and as a supply to the areas many wetlands.

The following water balance table summarizes the detailed regional water accounting contained in Volume 2. As shown in the table, imports are a large part of the applied water in the region.

State of the region

The Bay Region is home to over 80 water purveyors, each with their own water contracts, boards of directors, distinct water budgets and constituencies. The Bay Region does not have a regional water budget, or a designated regional body responsible for water planning and management decisions and recommendations.

Drinking water quality in the San Francisco Bay Area is generally good in areas served by San Francisco PUC's Hetch Hetchy Project and East Bay Municipal Utility District's Mokelumne River supply. Drinking water quality is lower in areas served by Delta diversions. Environmental water quality issues include the need to control stormwater, urban, and construction site runoff into the Bay. In general, groundwater quality throughout most of the region is suitable for most urban and agricultural uses with only local impairments.

The need to improve the long-term reliability of the water system during droughts and other emergencies is a major issue in the region. During drought periods, locally developed water supplies are very limited and imported water supplies are also at risk. Due to the large reliance on imported water from other regions, there is general concern over actions that could diminish this supply. Area of origin communities outside the San Francisco Bay Region will need more water as they grow and reallocation of water for instream flows or changes in Delta outflow requirements could affect the San Francisco Bay Regions' imported water supply.

The area is prone to major earthquakes that could damage and

interrupt water delivery. Critical seismic reliability upgrades are required for some facilities that cross or are located on three active earthquake faults. According to SFPUC, a major earthquake could disrupt water supplies for up to 60 days. Improvements are also required due to the age of the SFPUC system, deterioration, and deferred maintenance.

While invasive, non-native organisms are a problem in all of the nation's ports and waterways, the issue is particularly acute in San Francisco Bay. Scientists say that an alien species is introduced on average once every 14 weeks, totaling about 250 exotic species. Creatures such as the Chinese mitten crab and the Asian clam arrived aboard foreign ships and have spread throughout the bay region. Species from abroad are often more successful than native species because they have no natural predators. They can proliferate rapidly, forcing out local species, harming fisheries and choking power plants and drinking water systems.

Looking to the future

The San Francisco Bay Hydrologic Region is home to a multitude of planning organizations that seek to identify future trends and the challenges that accompany them. These groups are working on issues of land use, housing, environmental quality, and economic development, wetlands, water reliability, water quality, fisheries, and ecosystem restoration.

The storage of higher quality Delta water in Los Vaqueros Reservoir, as well as implementation of advanced water treatment, has improved the water quality in the service area of the Contra Costa Water District. Utilities in Solano County utilize a blend of local surface water and Delta water of variable quality delivered via the North Bay Aqueduct. Santa Clara Valley Water District, Alameda County Water District, and Zone 7 Water Agency employ a diversified portfolio of Delta water, local surface water, and groundwater. Implementation of secondary treatment of domestic wastewater has improved the quality, especially the oxygen content, of the San Francisco Bay Estuary.

On November 5, 2002, San Francisco voters approved a \$1.6 billion revenue bond measure to fund both regional and local projects. The capital improvement program includes 77 water infrastructure projects that replace or repair aging facilities, provides seismic upgrades and improves water supply reliability. The total cost of the projects is \$3.6 billion.

Many different wastewater reclamation/recycling and groundwater conjunctive projects are in study and environmental documentation stages. Water agencies are also studying many surface storage projects within the

Coalition

The Bay Area Water Agencies Coalition strives to provide a unified voice in water supply and water resources for seven agencies in the San Francisco Bay Region.

The ABAG-CALFED Task Force is a regional body of elected officials, water district officials, staff and non-governmental organizations that are actively engaged in an early process of integrated regional water management planning.

See Volume 2 for more detail.

Ongoing Planning Organizations

- The Association of Bay Area Governments (ABAG)
- Bay Area Wetlands Restoration Program
- Bay Area Water Agencies Association (BAWUA)
- Bay Area Dischargers Association
- Fish Passage Improvement Program
- San Francisco Estuary Institute
- Audubon Society – S.F. Bay Restoration Program
- S.F. Bay Area Pollution Prevention Group (BAPPG)
- Bay Area Stormwater Management Agencies Association (BASMAA) Bay Area Clean Water Agencies (BACWA)
- San Francisco Bay Conservation and Development Commission (BCDC)
- San Francisco Bay Area Water System Refinancing Authority
- San Francisco Estuary Project

region and in other regions to help with drought relief, emergency storage, and water quality management. One of these large projects, the Bay Area Water Supply and Reliability Projects, is sponsored by the Association of Bay Area Governments in cooperation with CALFED. Alameda County Water District is building a brackish water desalination facility to produce potable water from brackish water taken from local aquifers. A major new desalination project is proposed for Marin County using water from San Rafael Bay.

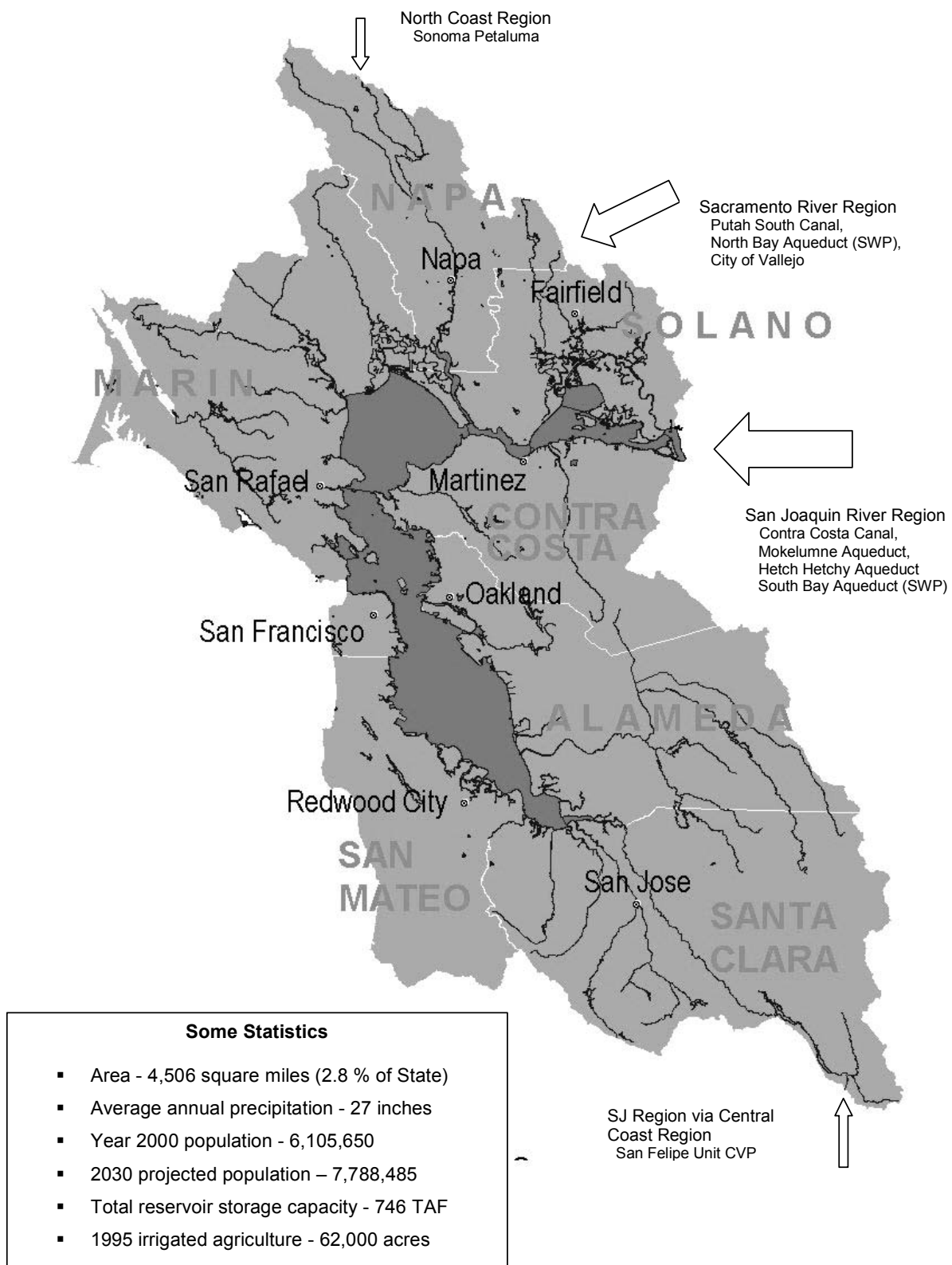
East Bay Municipal Utilities District, in conjunction with the Sacramento County Water Agency, is currently preparing preliminary design documents to divert water from the Sacramento River to reduce customer rationing during droughts. The project will reduce EBMUD's projected year 2020 customer rationing from 68 percent to 25 percent during

WATER BALANCE SUMMARY - TAF

Water Entering the Region – Water Leaving the Region = Storage Changes in Region

(See Volume 2 for Details)	1998 (wet)	2000 (average)	2001 (dry)
Water Entering the Region			
Precipitation	11,438	6,644	4,908
Imports from Other Regions	809	811	804
Total	12,247	7,455	5,712
Water Leaving the Region			
Consumptive Use of Applied Water * (Ag, M&I, Wetlands)	384	406	430
Exports to Other Regions	0	0	0
Required Outflow to Ocean	23	22	22
Additional Outflow to Ocean	695	718	755
Evaporation, Evapotranspiration of Native Vegetation, Groundwater Subsurface Outflows, Natural and Incidental Runoff, Ag Effective Precipitation & Other Outflows	11,141	6,477	4,780
Total	12,243	7,623	5,987
Storage Changes in the Region			
[+] Water added to storage			
[-] Water removed from storage			
Change in Surface Reservoir Storage	76	-25	-56
Change in Groundwater Storage	-72	-143	-219
Total	4	-168	-275
Applied Water * (compare with Consumptive Use)	1,123	1,167	1,231
* Definition - Consumptive use is the amount of applied water used and no longer available as a source of supply. Applied water is greater than consumptive use because it includes consumptive use, reuse, and outflows.			

SAN FRANCISCO BAY HYDROLOGIC REGION



AC Review Draft August 29, 2003. This is a draft for discussion purposes only. It has not been approved by DWR or Advisory Committee